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Project Summary

Pollution Prevention Research Within the Federal Community

N. T. Hoagland, J. S. Bridges, and TRC Environmental Corporation

This project summary describes the U.S. Environmental Protection Agency (EPA) Waste Reduction Evaluations at Federal Sites (WREAFS) program to support pollution prevention (P2) research throughout the Federal community, and the current status on all projects as of September 1994 is given. Under the WREAFS program, new techniques and technologies for reducing waste generation are identified through joint research, development, and demonstration (RD&D) projects. The WREAFS program has cooperatively supported pollution prevention projects at facilities within 10 of the Federal Government's major departments, agencies, or offices. The full report describes each WREAFS project completed as of September 1994 and provides brief synopses of projects ongoing or completed from September 1994 to March 1995.

This Project Summary was developed by EPA's Risk Reduction Engineering Laboratory, Cincinnati, OH, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

Since 1988, the EPA's Office of Research and Development, Risk Reduction Engineering Laboratory (RREL) in Cincinnati, OH, has conducted P2 opportunity assessments (PPOAs) and technology evaluations or demonstrations, or both at Federal facilities through its WREAFS program.

The WREAFS program identifies new technologies and techniques for reducing wastes from industrial and other processes performed by Federal agencies and enhances the adoption of P2 through technology transfer. Under the WREAFS Program, new techniques and technologies for reducing waste generation are identified through RD&D projects.

The full report describes each project conducted under the WREAFS program with a brief description of the facility, the processes addressed, P2 options identified, needed research, and the status of implementation of the recommended options (as of September 1994).

Completed Pollution Prevention Projects

From its inception to September 1994, the WREAFS program completed 18 joint efforts: Department of Defense (8); Department of Veteran's Affairs (1); Department of Transportation (2); Department of Energy (1); Department of Agriculture (1); Department of Interior (1); U.S. Postal Service (1); White House Complex (1); Department of Treasury (1) and a multiple-project interagency effort involving the EPA, Air Force, Army, Navy, and the National Aeronautics and Space Administration. Many of the WREAFS projects for the Departments of Defense and Energy were funded under the Strategic Environmental Research and Development Program (SERDP). Other projects were funded by the Federal agency or EPA or both.

These projects identified the processes and waste streams and then identified re-

search opportunities to implement P2 for a range of military and industrial operations including metal cleaning, solvent degreasing, spray painting, vehicle and battery repair, ship bilge cleaning, torpedo overhaul, buoy restoration, lens grinding, hospital operations, laboratory analysis, and mail processing.

Over 130 recommended P2 options have been identified as a result of these project, and these options can be readily adapted to similar processes used by other Federal facilities or by the private sector. Table 1 illustrates some of the sites, processes, and waste streams addressed in the WREAFS program. Each project is discussed in more detail in the full report.

In addition to the completed WREAFS projects, several new projects are underway or have been completed since September 1994. These are summarized in Table 2. Other pollution prevention research projects involving Federal agencies are shown in Table 3.

Conclusions

A number of WREAFS RD&D projects are completed and a number of efforts are ongoing. Perhaps the most important impact, however, will come from any resulting cultural change brought about by conducing a PPOA or reading an RD&D report. All Federal agencies must take an active role in P2 and set examples for others. The SERDP/WREAFS combination is an excellent illustration of the opportunities available for Federal agencies to wisely use funding and manpower to attain the goal of pollution prevention.

The full report was submitted in partial fulfillment of contract number 68-D2-0181 by TRC Environmental, Inc. under the sponsorship of the U.S. Environmental Protection Agency.

Table 1. *Waste Reduction Evaluation At Federal Sites (WREAFS)*

Summary of Completed Projects[1]

Site	*Process*	*Waste Streams*	*Sample P2 Options*
Philadelphia Naval Shipyard	*Painting, derusting*	*Paint solids, citric acid, TEA*	*Training, dragout reduction, 2-stage rinsing*
Naval Undersea Warfare Center Keyport Div	*Design, test, maintain torpedoes*	*Waste Otto fuel II, oil, plating baths, paint, solvents, acids, pesticides, dye, detergent, chromate and cyanide salts*	*Disposable cuffs, automated fuel tank draining, modify draining schedule, spent solvents recover/reuse*
Tinker AFB	*Repair, maintenance*	*CFCs, solvents, plating baths*	*Brush plating, MEK substitute, MEK recovery/reuse*
Scott AFB	*Aircraft maintenance, printed circuit board manufacture*	*Penetrant, emulsion, developer, solvents, paint solids, VOCs, reducing agents*	*Alternate bath replacement, dry silica developer, plastic blasting media, dry paint booth, HVLP guns, substitute reducing agents*
AF Plant #6	*Steel, aluminum parts preparation*	*TCE*	*Substitute water soluble emulsion cleaner for TCE*
Ft. Riley	*Battery repair, auto sub-assembly rebuilding*	*Battery acid, chromium and lead contaminated wastewater*	*Recycle battery acid, filter and recirculate wastewater*
Fitzsimmons Army Medical Center	*Eyeglass lens manufacturing*	*Solvents, glass fines, lead-bearing blocking compound, rinse water*	*Recycle glass fines in ceramics, substitute non-lead blocking alloy, filter wastewater*
VA Cin-Fort Thomas Medical Center	*Hospital operations*	*Disposable supplies*	*Reuse disposables, substitute nondisposables*
USCG Support Center New York	*Buoy and vessel maintenance and refurbishment*	*Paint, contaminated blasting media, solvents*	*HVLP paint guns, plastic blasting media, solvent recovery/reuse*
USCG Base Ketchikan	*Aids to navigation and vessel maintenance*	*Blasting wastes, solvents, waste paint, oil, bilge, coolant/antifreeze*	*Nontoxic paint, floor collector, plastic blasting media, HVLP guns, solvent recycling, solvent substitution, filtration*
DOE Sandia National Laboratories	*Geotech analysis, printed circuit boards made and repaired*	*Solvent, lab trash, rinse water, lead scraps, potting compound wastes*	*Test rinse water, eliminate steps, use both ends of swabs, eliminate sample bags*
USDA Beltsville Agricultural Research Center	*Agricultural research*	*Hazardous wastes, acid, base wastes, solvents*	*Training, waste segregation, equipment/process mods, auto nitrogen analysis, less solvent in HPLC*
DOI Bureau of Mines Albany Research Center	*Metals and minerals research*	*Solvents, combustibles, lead contaminated concrete, lab wastes*	*Inventory control, mod research design, distill and reuse solvents*
USPS Buffalo GMF and VMF	*General mail facility and vehicle maintenance*	*Paper, plastic, oil, adhesives, paints, cafeteria wastes, cleaners, solvents*	*Reusable containers, inventory, reusable food service materials, low VOC paints, aqueous cleaners*
White House Complex	*Paint shop, grounds maintenance, HVAC, office operations.*	*Solvents, paint, paper, water use*	*Reduce/recycle solvents, exterior paint, moisture sensor, HVAC water recycler, use recycled paper*
TIPPP (Ft Eustis, Langley AFB, NASA Langley Research Ctr Naval Base Norfolk)	*All types of base and community functions*	*Chemical materials, land mgt, depainting, solvents, metal working, electroplating, solid and painting wastes*	*Inventory control and tracking, pesticide mgt, product sub, waste segregation, equip/process modification*
NASA Langley Photo Labs	*Photoprocessing and X-ray operations*	*Developers, fixers, bleaches, silver-bearing wastes, scrap film, photo paper*	*One print per negative, electrolytic silver recovery with recovery cartridges*

** The Department of Treasury project is not included.*

Table 2. *Summary of WREAFS Projects Ongoing or Completed after September 1994*

Project	Description
Naval Ophthalmic Support and Training Activity (NOSTRA)	EPA, with technical support from NOSTRA, worked with the Optical Laboratories Association (OLA) and its member companies to reduce or eliminate process wastes such as MEK, acetone, methanol, toluene, xylene, TCE, and TCA. The technical evaluation was funded by the EPA's RREL. The results of the evaluation will be published in a journal article.
Naval Station Mayport, Jacksonville, FL	Through the Naval Facilities Engineering Services Center (NFESC), implementation of fluid filtration, recovery, and reuse technologies and rag-use reduction techniques were evaluated for application to the Public Works Operations.
U.S. Air Force Center for Environmental Excellence (AFCEE)	Using the data from the PPOAs conducted at the OC-ALC, a lessons learned document has been developed for aircraft repair P2 assessments and demonstrations. The project was funded under SERDP.
U.S. Army Corps of Engineers (USACE)	PPOAs were conducted at four USACE facilities as models for future assessments at similar types of Corps facilities. The facilities included in the assessment were: a hydropower plant, a repair station, an operational lock and dam (with ongoing major maintenance occurring within the lock chamber), and a flood control project. The project was funded under SERDP.
Fort Eustis Army Transportation Center	Under the TIPPP program, Fort Eustis has completed a base-wide P2 program plan, which identified a need to evaluate and upgrade painting, depainting, and corrosion control operations. Several improvements have been implemented. A Life Cycle Assessment (LCA) of painting and depainting operations is being conducted, beginning with an inventory analysis of improved chemical agent resistant coating (CARC) painting and depainting operations to determine the resources used and environmental releases. An impact analysis will determine the environmental consequences associated with CARC operations, including corrosion control techniques. By evaluating the environmental consequences, the improvement analysis will identify opportunities which will be implemented and evaluated on-site. The project is being funded under SERDP.
U.S. Coast Guard (USCG) Air Training Center, Mobile, AL	Joint assessments were conducted for P2 options in aircraft maintenance, aircraft fueling, flight simulators, and aircraft cleaning. This project was funded by EPA-RREL.
USCG Technology Assessments	A study was conducted to provide guidance for the USCG in choosing cost-effective parts cleaning chemicals that have minimum environmental and safety impacts. The three bases chosen for this study were: Aviation Training Center (ATC) Mobile, AL; Air Station Cape Cod (ASCC), Falmouth, MA; and Support Center NY (SCNY), Governors Island, NY. The project was jointly funded by USCG and EPA-RREL.
DOE LCA Design Case Studies	As a follow-on to the joint Life Cycle Assessment Research and Development (LCA RD&D), cross-cutting pollution prevention technologies and methodologies at DOE laboratories are being developed and demonstrated. The project is jointly funded by SERDP and DOE.
DOE LCA Research and Development Demonstration	This will build on current DOE/EPA LCA work, which is developing a technical framework, Life Cycle Cost Assessment (LCCA) to be included within a life cycle assessment. This project will take the framework to the next phase of demonstration allowing for further development and refinement of DOE products and processes. The project will be jointly funded by SERDP and EPA-RREL.
Bureau of Indian Affairs	Based in part on the work being done by tribal pueblos, a Pollution Prevention Resource Guide and workshop will be developed to provide technical assistance on source reduction to Indian tribes and businesses operating on Indian lands. The project will be funded by RREL.
USPS Pollution Prevention Opportunity Assessments	PPOAs are being conducted at six types of postal facilities, including an engineering and research development center; a stamp distribution center; a bulk mail facility; an area supply depot; a forensics laboratory; and customer service centers (small, medium, and large post offices). The recommendations should have applicability to other similar postal facilities throughout the United States. Also, an evaluation was conducted for recycling opportunities between the USPS and Federal Prison Industries. The project is jointly funded by USPS and EPA-RREL. Technology transfer will be in the form of project reports and an implementation workshop.

Table 2. *(continued)*

Project	Description
Office of Federal Facility Enforcement (OFFE) - F2P2 Manual	To assist Federal managers in reducing waste generation and emission rates in order to meet compliance objectives by using P2 tools, a manual was produced by the WREAFS program titled, “Federal Facilities Pollution Prevention—Tools for Compliance.” The project was jointly funded by EPA-RREL and EPA-FFEO.
Office of Federal Facility Enforcement (OFFE) - FMECI Support	In a project jointly funded by FFEO and RREL, RREL is providing support to EPA Regions in developing Pollution Prevention Supplemental Environmental Projects (SEPS) under the Federal Facilities Multi-Media Enforcement/ Compliance Initiative (FMECI). As requested, RREL will provide P2 solutions for violations and other identified areas of noncompliance at Federal sites. The first P2 SEP developed under this program was at Eielson Air Force Base.
NASA Langley Research Center - Dry Powder Towpreg	In performing its mission, LaRC develops composite materials for use in subsonic and supersonic aircraft applica tions. LaRC developed a new dry powder towpreg process to manufacture these composite materials. The process is a less hazardous way to impregnate carbon fibers with dry powder resin (towpreg) by using powdered polymers to coat fibers. The TIPPP project is demonstrating this innovative P2 technology and conducting a life-cycle analysis of its energy and environmental impacts. Final products are being compared with commercially produced products to determine comparable performance characteristics. The project is jointly funded by EPA and NASA.
NASA Langley Research Center - Pollution Prevention Program Implementation	Under TIPPP, a base-wide assessment of NASA-LaRC operations was conducted and a Pollution Prevention Program Plan for the facility was developed under the WREAFS program. WREAFS continues to support the implementation of selected projects from the Pollution Prevention Program Plan.

This Summary was authored by N. T. Hoagland, and J. S. Bridges with the Risk Reduction Engineering Laboratory, Cincinnati, OH 45268, and staff of TRC Environmental Corporation, Chapel Hill, NC 27514.
***N. T. Hoagland** is the EPA Project Officer (see below).*
The complete report, entitled "Pollution Prevention Research Within the Federal Community," (Order No. PB95-209623; Cost: $27.00, subject to change) will be available only from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Telephone: 703-487-4650

The EPA Project Officer can be contacted at:

Risk Reduction Engineering Laboratory
U.S. Environmental Protection Agency
Cincinnati, OH 45268

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Cincinnati, OH 45268

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